

A little about benzene.

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The planar structure of the benzene molecule and the identity of the bonds were proven by X-ray diffraction analysis and electron diffraction around the 1930s. This fact is indicated in every university textbook on organic chemistry. And here begins a very instructive and tragic story.

The fact is that after the structure of the benzene molecule, and therefore the absolute identity of the C-C bonds, was experimentally proven, a logical and unambiguous conclusion should have followed about a three-electron bond in the benzene molecule.

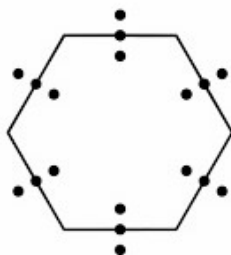
It's simple arithmetic. In a benzene molecule we have 6 absolutely identical C-C bonds and 18 electrons that form these bonds. Therefore, only one single conclusion can be drawn, namely, that there is a three-electron bond in the benzene molecule.

That is, the aromatic bond in benzene (C-C) is realized with the help of three electrons, which is absolutely obvious and visual (why this happens is another question). Based on the experimental data, it is simply impossible to draw a different conclusion. But the correct conclusion was not drawn.

A similar thing was observed in physics when interpreting the results of Rutherford's experiment (1909 - 1913, deflection of alpha particles on gold foil). That is, during the formation of the planetary model of the atom. Then, too, physicists did not perceive the conclusions of E. Rutherford (1911) in any way. But then N. Bohr came, and then you know...

Unfortunately, there were no Ernest Rutherford and Niels Bohr in chemistry.

What adds to the tragedy of this story is that J. Thomson proposed a three-electron bond for the benzene molecule back in 1921 (Thomson J. J. Philosophical Magazine, 1921, 41, 510-538).



But history took a different path. It's a pity...